Status of MUN (Municipal and Domestic Supply) POTW Project Monitoring

The initial full year of water quality monitoring characterizing ag dominated water bodies in the Sacramento Valley, 400-square mile case study area will be completed during the last week of March 2013. The following are general observations over the sampling period:

- Nitrate as Nitrogen was exceeded consistently in samples taken from Colusa, Willows, and Live Oak's Effluent. Samples taken from the first downstream water body after the treatment plant's receiving water site (Powell Slough, Ag Drain C at Road 60, and Wadsworth Canal) consistently did not have exceedances for Nitrate as Nitrogen.

- Ammonia as Nitrogen was exceeded only in samples taken from Biggs' Effluent. Samples taken from the first downstream water body after the treatment plant's receiving water site (C Main Drain) consistently did not have exceedances for Ammonia as Nitrogen.

- Almost all samples collected had exceedances for sodium. The criteria used to evaluate sodium data is the US EPA Drinking Water Advisory of 20 mg/L.

- Samples with exceedances for total Aluminum, Iron, and Manganese were observed only in receiving water sites upstream and downstream of the cities' effluent. All samples taken from the cities' effluent were below the Secondary MCLs for Aluminum, Iron, and Manganese.

- Most of the arsenic exceedances were reported on the east side of the Sacramento River in the smaller upstream water bodies and Live Oak effluent. The elevated concentrations did not reach the Wadsworth Canal or the Sutter Bypass.

- Chloroform, Bromodichloromethane, and Dibromochloromethane were exceeded only in samples taken from Willows' Effluent. Samples taken from the first downstream receiving water site did not have exceedances for these chemicals.

- Boron was exceeded only in samples taken from the New Ditch (upstream of Colusa's Effluent), an area irrigated with groundwater. Samples taken from Colusa's Effluent had no exceedances for Boron.

Storm Season Observations
(Actual storm events sampled: November 27 and 29, December 26 and 27)

1. *No Total Arsenic and Nitrate as Nitrogen exceedances observed in Lateral #2 from Live Oak during December 2012.* Exceedance for these parameters occurred during other storm season sampling events.
2. *No Nitrate as Nitrogen exceedances observed in Unnamed Tributary from Colusa during November 2012 and December 2012.* Exceedances were observed during October and January.
3. *No differences observed in Biggs and Willows sample sites as far as samples with exceedances.* Water levels at most Biggs and Willows sample sites were elevated during November and December.

Proposed Monitoring for April 2013 – September 2013

Continue current monitoring, including 2x/month field analyses due to specific conductance variability, with the following adjustments:

1. *Stop Sampling for Nitrate as Nitrogen at Biggs sample sites*

   There have been zero exceedances for Nitrate as Nitrogen at all Biggs sample sites. Biggs WWTP does not have nitrification to remove ammonia. Ammonia as Nitrogen was exceeded in Biggs' effluent and sporadically at the first receiving water site.

2. *Stop Sampling for Boron at Biggs, Live Oak, and Willows sample sites.*

   The highest result between all three wastewater treatment plants is 320 ug/L. The criterion for Boron is 1000 µg/L.

3. *Change Total Fluoride sampling from quarterly to monthly for Colusa sample sites only.*

   One January sample from Powell Slough had an exceedance over the Primary MCL of 2.0 mg/L for Total Fluoride. There were no exceedances in Colusa's effluent.

4. *Resume Total and Dissolved Arsenic sampling to all sample sites.*

   Exceedances were observed in New Ditch and Unnamed Tributary sample sites from Colusa (westside of the study area) on July 24, August 28, and September 25. The results were received after the stakeholder recommendation to restrict arsenic analyses to the eastside of the study area.

Remaining BSK Budget: $26,220

Costs to conduct adjusted monitoring April thru September: $25,096

Summary of Exceedances (October 2012 - January 2013)

	Colusa			Willows			Live Oak			Biggs		
Parameter	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream
Aluminum - Total	X		X	X		X			X	X		X
Arsenic - Total							X	X	X			
Arsenic - Dissolved							X	X	X			
Iron - Total	X		X	X		X			X	X	X	X
Iron - Dissolved						X						
Manganese - Total	X		X			X	X		X	X		X
Manganese - Dissolved	X		X							X		
Nitrate as Nitrogen		X	X		X		X	X	X			
Sodium	X	X	X	X	X	X	X	X	X	X	X	X
TDS	X	X	X		X		X	X	X			
Conductivity	X	X	X									
Boron	X											
Fluoride - Total			X									
Sulfate	X		X									
Ammonia as Nitrogen											X	X
Chloroform					X							
Bromodichloromethane					X							
Dibromochloromethane					X							

Summary of Exceedances (April 2012 - January 2013)

	Colusa			Willows			Live Oak			Biggs		
Parameter	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream
Aluminum - Total	X		X	X		X	V		X	X		X
Arsenic - Total	W		W				X	X	X			
Arsenic - Dissolved							A	A	A			
Iron - Total	X		X	X		X	V		X	X	B	X
Iron - Dissolved						Y						
Manganese - Total	X		X	V		X	X		X	X		X
Manganese - Dissolved	A		Y			W				A		W
Nitrate as Nitrogen		X	X		X		X	X	X			
Sodium	X	X	X	X	X	X	X	X	X	B	X	X
TDS	A	X	A		X		A	X	A		Z	
Conductivity	X	B	X				Z	Z	Z		W	
Boron	B											
Fluoride - Total			Y									
Sulfate	Y		Y									
Ammonia as Nitrogen											X	A
Chloroform					X							
Bromodichloromethane					X							
Dibromochloromethane					X							

Z	= Exceedance observed in April 2012 - June 2012 Samples Only (Quarter 1)
V	= Exceedance observed in April 2012 - September 2012 Samples Only (Quarter 1 & 2)
W	= Exceedance observed in July 2012 - September 2012 Samples Only (Quarter 2)
A	= Exceedance observed in July 2012 - January 2013 Samples Only (Quarter 2 and 3)
Y	= Exceedance observed in October 2012 - January 2013 Samples Only (Quarter 3)
B	= Exceedance observed in April 2012 - June 2012; October 2012 - January 2013 Samples Only (Quarter 1 & 3)
X	= Exceedance observed in April 2012 - January 2013 Samples (Quarter 1, 2, 3)